

## Claims

I claim:

- 5 1. A method of transporting an pharmacologically active form of Substance P, or neuropeptide, across the blood-brain barrier into the central nervous system of a living subject using the chimeric hybrid molecule comprising a cyclic alkaloid moiety which binds as an agonist to a mammalian or human mu ( $\mu$ ) opioid receptor and a  
10 peptide moiety which binds as an agonist to a mammalian/human substance P.
2. A method of transporting a pharmacologically active form of substance P, or neuropeptide, across the blood-brain barrier into  
15 the central nervous system of a living subject using the active metabolite of morphine, morphine 6-glucuronide, contained within chimeric hybrid molecules wherein:
  - a. One moiety of the chimeric hybrid molecule binds as an  
20 agonist to the mu ( $\mu$ ) opioid receptor and the other moiety of which binds as an agonist to the substance P receptor comprised of:

(i) chemically modified morphine in which morphine covalently linked through its 6'OH group comprises the mu ( $\mu$ ) opioid receptor agonist moiety;

5 (ii) the substance P fragment N-acetyl-SP [3-11]:  
sequence of Ac-KPQQFFGLM-NH<sub>2</sub> (SEQ. ID. NO. 1),  
covalently linked through its  $\epsilon$  (epsilon) amino  
group, which comprises the substance P receptor  
agonist moiety; and

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(iii) the six carbon carbohydrate d-glucuronic acid,  
covalently cross linking morphine through its 6'OH  
group via an o-glycosidic bond to the  $\epsilon$  (epsilon)  
amino group of the substance P fragment N-acetyl-SP  
15 [3-11] via a pseudo peptide bond, which comprises a  
compact molecular hinge linking the two moieties;  
or

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b. One moiety of the chimeric hybrid molecule binds as an  
20 agonist to the mu ( $\mu$ ) opioid receptor and the other  
moiety of which binds as an agonist to the substance P  
receptor comprised of:

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(i) chemically modified morphine in which morphine covalently linked through its 6'OH group comprises the mu ( $\mu$ ) opioid receptor agonist moiety;

5 (ii) the substance P fragment SP [5-11]: sequence of QQFFGLM-NH<sub>2</sub> (SEQ. ID. NO. 2), covalently linked through its  $\alpha$  (alpha) amino group, which comprises the substance P receptor agonist moiety; and

10 (iii) the six carbon carbohydrate d-glucuronic acid, covalently cross linking morphine through its 6'OH group via an o-glycosidic bond to the  $\alpha$  (alpha) amino group of the substance P fragment SP [5-11] via a pseudo peptide bond, which comprises a  
15 compact molecular hinge linking the two moieties,  
or

c. A chimeric hybrid molecule one moiety of which binds as an agonist to the mu ( $\mu$ ) opioid receptor and the other  
20 moiety of which binds as an agonist to the substance P receptor comprised of:

(i) chemically modified morphine in which morphine covalently linked through its 6'OH group comprises the mu ( $\mu$ ) opioid receptor agonist moiety;

5 (ii) the substance P fragment SP [7-11]: sequence of FFGLM-NH<sub>2</sub> (SEQ. ID. NO. 3), covalently linked through its  $\alpha$  (alpha) amino group, which comprises the substance P receptor agonist moiety; and

10 (iii) the six carbon carbohydrate d-glucuronic acid, covalently cross linking morphine through its 6'OH group via an o-glycosidic bond to the  $\alpha$  (alpha) amino group of the substance P fragment SP [7-11] via a pseudo peptide bond, which comprises a  
15 compact molecular hinge linking the two moieties.

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